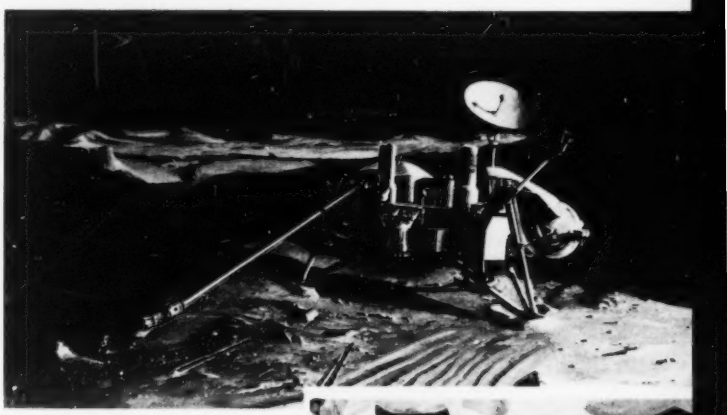
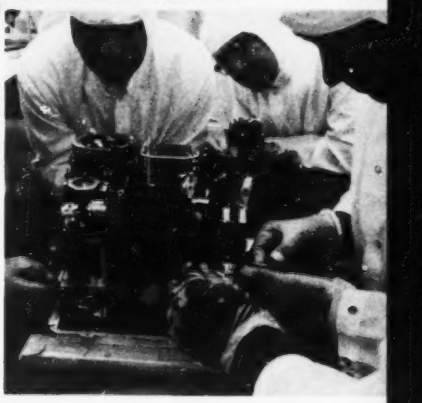
THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME X, NUMBER 10 NOVEMBER, 1980

SILVER JOINS IN SEARCHING FOR LIFE ON MARS





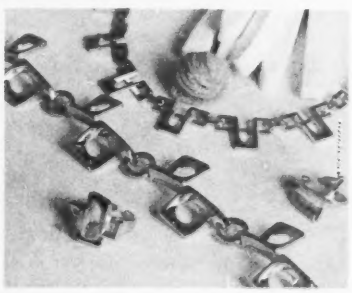
A new alloy containing more than 80% silver developed by Roy I. Batista of **TRW Inc.,** 1 Space Park, Redondo Beach, California has solved the problem of bonding stainless steel to titanium to form the strong, light weight biology experiment equipment (*lower photo*) of the Viking which traveled nearly half a billion miles to land on the planet Mars as pictured in the larger photo.

Conventional brazing and welding processes had not been effective in joining titanium to stainless steel, which have quite different metallurgical characteristics. Titanium, for example, has a very high melting point of over 3000° Fahrenheit, whereas stainless steel typically melts 400° lower. However, these two materials, bonded together, are essential for the performance of the Viking biology experiment instruments which scooped up and meticulously analyzed samples of the planet's surface.

The silver-brazed Viking mini-laboratory made the first chemical report of signs of life on Mars. Whether our kind of life or not, it found a soil so exotic that it chemically mimics life processes on earth—to the great excitement of the world scientific community.

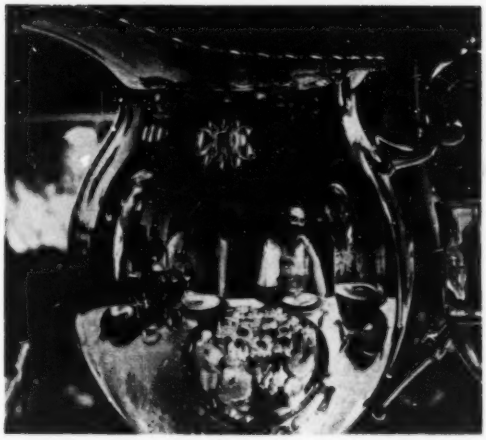
The development of this new silver bonding process is one of 104 advances in silver brazing and soldering which The Silver Institute has summarized in the last seven years for wider use in industry: **last year more than 10 million troy ounces of silver were used for brazing and soldering in the U.S. alone.**

FOR HOLIDAY GIFTS—GIVE STERLING



Gori & Zucchi jewelry above. Tane, S.A. jewelry at left.

Whether it's tableware or something to wear, if it's sterling silver you know it will be a gift that will be appreciated for its beauty, its durability and its continuing intrinsic value. Such a gift might include sumptuous Mexican silver bracelets, necklaces and earrings crafted by **Tane, S.A.** such as those shown at left which are available at Georgetown's **Phoenix** store, 1514 Wisconsin Ave., N.W., Washington, D.C. 20007 at prices ranging from $10 to $400. Others will be attracted to fine craftsmanship of the pictured UnoAErre brand of jewelry, or



other jewelry manufactured in Italy by **Gori & Zucchi,** Via Fiorentina 550, 52100 Arezzo, Italy and distributed in the U.S. by **Aurea Jewelry Creations,** 580 Fifth Avenue, New York, N.Y. 10036.

Lovely and charming sterling silver gifts might include tiny charms or Christmas tree decorations, many costing less than $20, or a four gram 999 fine silver ingot on a silver chain—an interesting conversation piece for less than $15!

Then there is the unquestioned elegance of beautiful sterling silver flatware, or sterling silver reproductions of museum flatware. To complement sterling silver place settings, a gift of a sterling candelabra by Gorham, or a sterling silver fruit bowl by Paul Revere—costing between $150 and $1,100—would certainly be appreciated by any family.

And this year, **your sterling silver gifts will shine at the next party without having to take the time and trouble of polishing them** if you put a small (two inch by seven inch) slip of paper near your silver in your cabinet, box, drawer, or any other confined area. This paper, called "Silver Protector Strips" by 3M, contains an active ingredient that absorbs the air-borne sulphur that causes tarnish, and will keep your silver from tarnishing for 6 months or more. And it can not harm silver surfaces.

"Silver Protector Strips" may be purchased in packages of 12 strips by sending a check or money order for $3.99, including postage and handling, to **"3M Silver Protector Strips"**, 3M Mailing Service, P.O. Box 43416, St. Paul, Minnesota 55164. A great idea for a Christmas stocking stuffer!

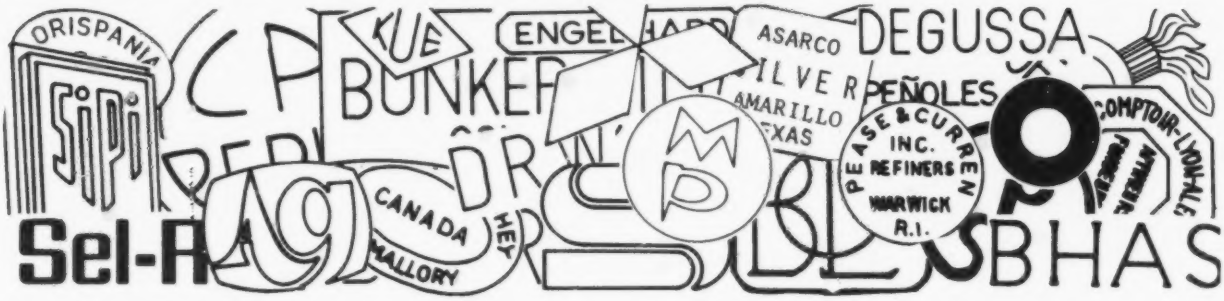
NEW SILVER TECHNOLOGY REPORTS POWERFUL CATALYTIC EFFECTS OF SILVER

The last issues of **New Silver Technology** summarize several important industrial advances made possible by the use of silver as a catalyst.

- Silvestre Sanchez Torres, 30 Poniente, N° 1512, Interior 2, Puebla, Mexico has been awarded British Patent 1,557,709 on a silver catalytic converter to greatly reduce the emission of harmful pollutants and noise in automotive engine exhaust.
- Carbon monoxide in air is converted to harmless carbon dioxide by contact with silver containing yttrium, developed by the Faculty of Chemistry of the University of Sofia, Bulgaria.
- Improved silver catalysts for making ethylene oxide, the base for billions of pounds of polyesters, have been developed this year by Imperial Chemical Industries Ltd. of London, BASF AG at 6700 Ludwigshafen, and Mitsui Toatsu Chemicals, Inc. of Tokyo.
- Du Pont in Wilmington, Delaware can now make formaldehyde for the production of millions of board feet of plywood with greater efficiency by the use of a new silver-gold catalyst.
- High octane gasoline and synthetic rubber can be made by a silver-catalyzed dehydrogenation process for which Phillips Petroleum of Bartlesville, Oklahoma has been issued U.S. Patent 4,191,846.
- For the production of acrylic type polymers, metallic silver plays a key role in the new process of U.S. Patent 4,180,681 developed by Arco Chemical Co., Glenolden, Pennsylvania.
- Dow Chemical Co., Midland, Michigan has developed an ingenious method for producing porous electrodes in which the tiny pores are uniformly coated with metallic silver. The powerful catalytic effect of the silver surfaces permits their use as efficient air electrodes for fuel cells, but of even greater immediate importance, when they are used as the cathodes of industrial chlorine-caustic soda cells, they produce these industrial products at substantially lower voltage and lower electric power costs.
- For treating industrial effluent gases containing sulfide pollutants, silver is an essential element in a new catalyst developed by Institut Français du Petrole, Rueil-Malmaison, France and described in U.K. Patent Application 2,025,386-A.

These are examples of 280 detailed summaries of silver developments in 20 categories, presented in the four quarterly issues of 1980. **New Silver Technology** is available from The Silver Institute at the annual price of US$30 for the four 1981 issues.

UPDATED BOOK ON SILVER INGOT MARKS NOW AVAILABLE



Above are a few of the ingot marks from some of the 77 firms from 20 nations that refine silver to 99.9% purity, which are included in The Silver Institute's updated publication, SILVER REFINERS OF THE WORLD AND THEIR IDENTIFYING INGOT MARKS. This unique publication contains the names, addresses and telephone numbers of silver refiners, alphabetically arranged by countries, and by companies, together with the identifying marks of their silver ingots (or bars). The identifying marks are shown in actual size except where a different size is indicated.

Commercial silver ingots contain 99.9% or more pure silver and they usually weigh 1,000 troy ounces or 31 kilograms; however, the exact weight, guaranteed fineness, melt number and ingot number are all stamped on each ingot.

This book also contains detailed specifications of refined silver, including methods of sampling and analysis, as codified by the American Society for Testing and Materials (ASTM). The publication is available from The Silver Institute for US$5.00.

EMPRESS MARIA THERESA AGAIN SHOWN ON SILVER COIN

Austria recently issued 1,100,000 specimens of 640 fine silver 500 Schilling coins commemorating the 200th anniversary of the death of Empress Maria Theresa of Austria-Hungary, and, in effect, the birth of one of the world's most popular coins—the 1780 Maria Theresa Thaler. Both coins are shown below.

The 1780 Maria Theresa Thaler measures 42.5 mm in diameter and is 83.33 percent pure silver. It has enjoyed global popularity because of its attractive design and consistent silver content. This coin was later struck in mints in Prague, Milan, Florence, Venice, Rome, Leningrad, London, Paris, Brussels, Bombay and other mints in an effort to gain acceptance in trade. And, even to this day, the Maria Theresa Thaler circulates to some degree in the Near East and Africa as an accepted currency.

1980 Maria Theresa coin above.
1780 Maria Theresa Thaler below.

The Maria Theresa Thaler was not the first coin to be called a "thaler". In the early 15th century, the Kings of Bohemia minted a coin called the Joachimsthaler because the most prolific silver mines in Europe were in Joachimsthal in the Kingdom of Bohemia, and it contained eight-tenths of an ounce of silver, as did the "thalers", sometimes called "talers", issued during the following centuries. The American colonies were familar with the "thaler" and its silver content, and when the colonies achieved independence from England, Alexander Hamilton proposed that the currency of the United States be called the dollar—an obvious corruption of the word "thaler".

The new silver coin, commemorating the death of Maria Theresa and reminding one of silver's historic and respected role as an international store of value through the centuries, can be purchased from **Schoeller & Co. Bank A.G.,** Renngasse 1-3, A-1010 Vienna, Austria. A restrike of the famous silver Maria Theresa Thaler and the 1967 silver 25 Schilling Austrian coin commemorating the 250th anniversary of the birth of Empress Maria Theresa are also available at this bank. An Uncirculated Set of all three coins sells for about US$80, including postage and insurance.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES	MILLION TROY OUNCES				
	October 1980	Oct 1980	Sep 1980	Jan-Oct 1980	Jan-Oct **1979	Full Yr 1979
THESE REFINERS' PRODUCTION, BY SOURCE		*MONTHLY RATE*				
From Primary (ores & concentrates)	1,815,002	1.8	1.9	3.4	4.8	4.8
From Coins	515,649	0.5	1.9	1.7	0.2	0.5
From Old Scrap (used photo film & other products)	5,695,430	5.7	3.7	6.3	5.2	5.2
From New Scrap (in-plant clippings, waste)*	2,576,746	2.6	3.3	2.7	2.0	2.3
TOTAL PRODUCTION	10,602,827	10.6	10.8	14.1	12.2	12.7
TOTAL PRODUCTION Less New Scrap*	8,026,081	8.0	7.5	11.4	10.2	10.4
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	7,508,595	7.5	7.7	9.2	8.8	9.0
Refined on Toll for Others	3,094,232	3.1	3.1	4.9	3.4	3.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	4,861,059	4.9	5.0	4.8	3.0	3.1
Shipped Out: Own materials	2,313,734	2.3	3.5	4.6	6.6	7.0
Against Tolls	3,146,580	3.1	3.1	4.7	2.4	2.7
TOTAL DISPOSITION	10,321,373	10.3	11.6	14.2	12.0	12.8
TOTAL DISPOSITION Less New Scrap*	7,744,627	7.7	8.3	11.5	10.0	10.5
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)	+281,454	+0.3	−0.8	*TOTAL FOR PERIOD* −0.5	+1.7	−1.3
THESE REFINERS' STOCKS AT END OF PERIOD	1,070,492	1.1	0.8	1.1	4.6	1.6

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES	MILLION TROY OUNCES				
	October 1980	Oct 1980	Sep 1980	Jan-Oct 1980	Jan-Oct 1979	Full Yr 1979
THESE REFINERS' PRODUCTION, BY SOURCE		*MONTHLY RATE*				
From Primary (ores & concentrates)	13,095,229	13.1	11.6	12.2	12.8	12.7
From Coins	0	0.0	0.0	0.1	0.0+	0.0+
From Old Scrap (used photo film & other products)	8,909,763	8.9	7.8	7.9	3.5	4.1
From New Scrap (in-plant clippings, waste)*	1,700,134	1.7	1.4	1.5	0.7	0.8
TOTAL PRODUCTION	23,705,126	23.7	20.8	21.6	17.0	17.6
TOTAL PRODUCTION Less New Scrap*	22,004,992	22.0	19.4	20.2	16.3	16.8
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	19,397,247	19.4	17.0	17.7	14.6	15.2
Refined on Toll for Others	4,307,879	4.3	3.7	4.0	2.4	2.4
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	7,584,723	7.6	6.7	7.5	3.8	4.3
Shipped Out: Own materials	10,566,839	10.6	10.0	10.3	11.3	11.3
Against Tolls	4,258,676	4.3	3.8	3.4	1.9	2.0
TOTAL DISPOSITION	22,410,238	22.4	20.4	21.3	17.0	17.6
TOTAL DISPOSITION Less New Scrap*	20,710,104	20.7	19.0	19.8	16.3	16.8
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)	+1,294,888	+1.3	+0.3	*TOTAL FOR PERIOD* +3.7	+0.2	+0.4
THESE REFINERS' STOCKS AT END OF PERIOD	9,032,989	9.0	7.7	9.0	5.2	5.3

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

** Revised

THE SILVER INSTITUTE

A WORLDWIDE ASSOCIATION OF MINERS, REFINERS, FABRICATORS AND MANUFACTURERS

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